AMENDMENTS TO THE CLAIMS

1. (Withdrawn) A method comprising:

a) sequentially removing nucleotides from one end of at least one nucleic acid molecule;

b) moving the nucleotides through a channel packed with nanoparticles;

c) identifying one or more nucleotides by Raman spectroscopy; and

d) characterizing the nucleic acid.

2. (Withdrawn) The method of claim I, wherein the nucleotides are removed from the nucleic acid by exonuclease activity.

3. (Withdrawn) The method of claim 1, further comprising identifying single nucleotide molecules.

4. (Withdrawn) The method of claim 3, wherein the nucleotides are unlabeled.

5. (Withdrawn) The method of claim 3, wherein the nucleotides are labeled.

6. (Withdrawn) The method of claim 3, further comprising identifying single adenosine nucleotide molecules.

7. (Withdrawn) The method of claim 1, wherein only adenosine and guanosine nucleotides are identified.

8. (Withdrawn) The method of claim 1, wherein only cytidine and thymidine nucleotides are identified.

9. (Withdrawn) The method of claim 1, further comprising separating the purine or pyrimidine bases from the nucleotides.

10. (Withdrawn) The method of claim 9, wherein the separated purine or pyrimidine bases are identified by Raman spectroscopy.

11. (Withdrawn) The method of claim 1, wherein a single nucleic acid molecule is sequenced.

12. (Withdrawn) The method of claim 1, wherein the nucleotides are identified by surface enhanced Raman spectroscopy (SERS), surface enhanced resonance Raman spectroscopy (SERRS) and/or coherent anti-Stokes Raman spectroscopy (CARS).

13. (Withdrawn) The method of claim 1, wherein the channel is a nanochannel or microchannel.

14. (Withdrawn) The method of claim 1, further comprising identifying the nucleic acid.

15. (Withdrawn) The method of claim 1, further comprising sequencing the nucleic acid.

16. (Withdrawn) The method of claim 1, further comprising identifying a single nucleotide polymorphism in the nucleic acid.

17. (Withdrawn) A method comprising:

a) preparing a nucleic acid comprising labeled nucleotides;

b) sequentially removing nucleotides from one end of the nucleic acid;

c) moving the nucleotides through a channel packed with nanoparticles;

d) identifying one or more nucleotides by Raman spectroscopy; and

e) characterizing the nucleic acid.

18. (Withdrawn) The method of claim 17, wherein each type of nucleotide is labeled with a distinguishable Raman label.

19. (Withdrawn) The method of claim 18, wherein only pyrimidine nucleotides are labeled.

20. (Withdrawn) The method of claim 18, wherein only purine nucleotides are labeled.

21. (Withdrawn) The method of claim 17, wherein single nucleotide molecules are identified.

22. (Withdrawn) The method of claim 17, further comprising identifying single adenosine nucleotide molecules.

23. (Withdrawn) The method of claim 17, further comprising separating the nucleotides from the nucleic acid.

24. (Withdrawn) The method of claim 23, further comprising imposing an electric field to move the nucleotides through the channel.

25. (Withdrawn) The method of claim 12, further comprising recording the time at which each nucleotide passes through said channel.

26. (Currently Amended) An apparatus comprising:

a) a reaction chamber;

b) a first channel in fluid communication with the reaction chamber;

c) a second channel in fluid communication with the first channel;

d) a plurality of cross-linked nanoparticle aggregates affixed within the second channel, wherein the nanoparticle aggregates enhance a Raman signal; and

e) a Raman detector operably coupled to the second channel,

wherein the plurality of cross-linked nanoparticles aggregates affixed within the second channel are packed and stationary within the second channel.

27. (Previously Presented) The apparatus of claim 26, wherein the Raman detector operable coupled to the nanoparticle affixed channel is capable of detecting single nucleotide molecules interacting with the affixed nanoparticle aggregates.

28. (Original) The apparatus of claim 26, further comprising a first electrode and a second electrode to move nucleotides from the first channel into the second channel.

29. (Previously Presented) The apparatus of claim 26, wherein the first channel is a microfluidic channel.

30. (Previously Presented) The apparatus of claim 26, wherein the second channel is a nanochannel or a microchannel.

31. (Previously Presented) The apparatus of claim 26, wherein the portion of nanoparticle aggregates comprise between two to six nanoparticles per aggregate.

32. (Previously Presented) The apparatus of claim 26, wherein the portion of nanoparticle aggregates comprise two nanoparticles per aggregate.

33. (Previously Presented) The apparatus of claim 31, wherein nanoparticles comprising the aggregates comprise gold and/or silver, and the nanoparticles are between about 1 nm and 2 μm in size.

34. (Previously Presented) The apparatus of claim 26, wherein the plurality of cross-linked nanoparticle aggregates affixed within the second channel are throughout a cross sectional area of the second channel and the Raman detector is adapted to detect said Raman signal.